



US009989128B2

(12) **United States Patent**
Foster et al.

(10) **Patent No.:** **US 9,989,128 B2**
(45) **Date of Patent:** **Jun. 5, 2018**

(54) **MULTI-SPEED TRANSMISSION**

(71) Applicant: **Allison Transmission, Inc.**,
Indianapolis, IN (US)

(72) Inventors: **Michael Foster**, Carmel, IN (US);
Brian Schoolcraft, Crawfordsville, IN (US)

(73) Assignee: **ALLISON TRANSMISSION, INC.**,
Indianapolis, IN (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **15/718,161**

(22) Filed: **Sep. 28, 2017**

(65) **Prior Publication Data**

US 2018/0017140 A1 Jan. 18, 2018

Related U.S. Application Data

(63) Continuation of application No. 15/196,929, filed on Jun. 29, 2016, now Pat. No. 9,803,725.

(60) Provisional application No. 62/191,714, filed on Jul. 13, 2015.

(51) **Int. Cl.**
F16H 3/66 (2006.01)

(52) **U.S. Cl.**
CPC **F16H 3/666** (2013.01); **F16H 2200/006** (2013.01); **F16H 2200/2012** (2013.01); **F16H 2200/2043** (2013.01)

(58) **Field of Classification Search**

CPC F16H 3/666
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

9,470,293 B1 * 10/2016 McCauley F16H 3/666
9,625,007 B2 * 4/2017 Long F16H 3/66
9,726,256 B2 * 8/2017 Muller F16H 3/66

* cited by examiner

Primary Examiner — Derek D Knight

(74) *Attorney, Agent, or Firm* — Taft Stettinius & Hollister LLP; Stephen F. Rost

(57) **ABSTRACT**

A multiple speed transmission includes an input member, an output member, a plurality of planetary gearsets, a plurality of interconnecting members and a plurality of torque-transmitting mechanisms. Each of the plurality of planetary gearsets includes a sun gear, a ring gear, and a carrier member with pinion gears. The input member is continuously interconnected with at least one member of one of the plurality of planetary gear sets, and the output member is continuously interconnected with another member of one of the plurality of planetary gear sets. At least eight forward speeds and one reverse speed are achieved by the selective engagement of the plurality of torque-transmitting mechanisms.

20 Claims, 13 Drawing Sheets

